

**UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION**

GEORGETOWN RAIL EQUIPMENT CO.,	§	
	§	Civil Action No. 6:13-cv-366-JDL
Plaintiff,	§	
	§	
v.	§	
	§	
HOLLAND L.P.,	§	
	§	
Defendant.	§	

MEMORANDUM OPINION AND ORDER

This claim construction Opinion construes terms of Claim 16 in United States Patent No. 7,616,329 (the “329 Patent”). Plaintiff Georgetown Rail Equipment Co. (“Georgetown”) alleges Defendant Holland L.P. (“Holland”) infringes Claim 16 of the ‘329 Patent.

I. BACKGROUND

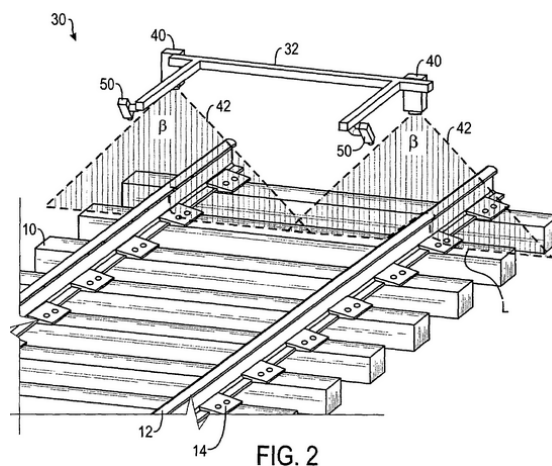
In view of the Court’s Order Granting Georgetown’s Motion for Preliminary Injunction (Doc. Nos. 51, 81), the Court granted Holland’s Letter Brief Requesting an Early *Markman* Hearing (Doc. No. 57). For the Early *Markman*, Holland filed a Combined Motion for Claim Construction and Summary Judgment of Non-Infringement (Doc. No. 78). Georgetown filed a Response (Doc. No. 80), and Holland filed a Reply (Doc. No. 83). On February 14, 2014, the Court held an early *Markman* addressing three terms. *See* Doc. No. 103 (“February Hr’g Tr.”).

On March 20, 2014, the Court held a second *Markman* Hearing addressing six additional terms. For the March *Markman*, Georgetown filed an Opening Claim Construction Brief (Doc. No. 96), and Holland filed a Responsive *Markman* Claim Construction Brief (Doc. No. 101). Georgetown filed a Reply (Doc. No. 105). Holland also filed a Motion for Summary Judgment of Indefiniteness (Doc. No. 100), Georgetown responded (Doc. No. 106), and Holland replied (Doc. No. 107). The Motion for Summary Judgment of Indefiniteness was also heard at the

hearing on March 20, 2014.

II. THE PATENT

The patent-in-suit generally relates to a system and method for inspecting railroad track using lasers, cameras, and a processor. *See* '329 Patent col. 2:14-34. Specifically at issue in this case is a system for inspecting tie plates. Doc. No. 21 at 1. Figure 2, below, shows how a tie plate (14) secures the rail (12) to the crosstie (10) or "sleeper."



'329 Patent Figure 2.

Claim 16 is the only asserted claim, and recites in its entirety:

16. A system for inspecting a railroad track bed, including the railroad track, to be mounted on a vehicle for movement along the railroad track, the system comprising:

at least one light generator positioned adjacent the railroad track for projecting a beam of light across the railroad track bed; at least one optical receiver positioned adjacent the railroad track for receiving at least a portion of the light reflected from the railroad track bed and generating a plurality of images representative of the profile of at least a portion of the railroad track bed; and at least one processor for analyzing the plurality of images and determining one or more physical characteristics of the said portion of the railroad track bed, the one or more physical characteristics comprising at least a geographic location of the plurality of images along the railroad track bed, wherein the processor includes an algorithm for detecting a misaligned or sunken tie plate of the railroad track bed, the algorithm comprising the steps of:

(a) analyzing a frame of the plurality of images, the frame comprising a region of interest;

- (b) determining whether the region of interest contains a tie plate;
- (c) if a tie plate is present, determining a crosstie contour and a tie plate contour;
- (d) comparing an orientation of the crosstie contour and an orientation of the tie plate contour; and
- (e) determining whether the tie plate is misaligned or sunken based upon the comparison.

‘329 Patent col. 11:41-12:2.

Notably Claim 16 recites “at least one light generator” and “at least one optical receiver.”

‘329 Patent col. 11:43, 46. The specification describes the use of a “light generator such as a laser 40 [and] a device for receiving light reflected from the area to be inspected such as a camera 50,” as shown in Figure 1. *Id.* at col. 3:30-3.

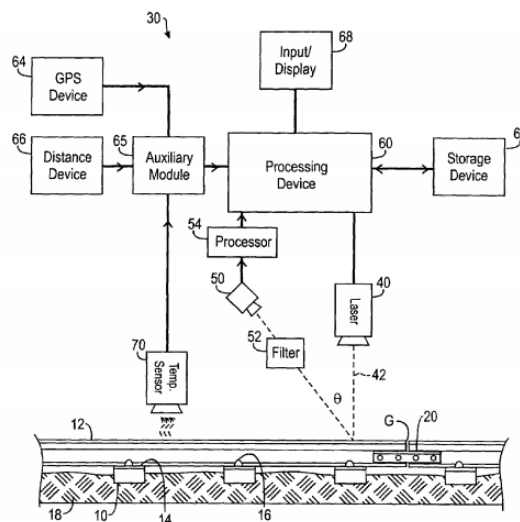


FIG. 1

‘329 Patent Figure 1. Figure 1 also shows how “the cameras 50 are mounted at an angle θ with respect to the beam 42 of light projected from lasers 40.” ‘329 Patent col. 4:33-36. Because the laser 40 and camera 50 are fixed relative to each other, a three dimensional measurement of the

track bed can be constructed.¹ Specifically, the specification provides that:

“[w]ith the beams 42 projected onto the irregular surface of the track and viewed at an angle, the projected line L shown in FIG. 2 follows the contours of the surface and components of the track bed. An example image or frame showing the projected line L of the track bed is shown in FIG. 3. The image data or frame includes a plurality of pixels given X-Y coordinates and shows a contour of the track bed captured by the cameras 50. [Using] image processing techniques known in the art, the image includes two pixel values, where the dark pixels represent the contour of the track bed. Every pixel of a given image data is given the same Z-coordinate, which represents the particular position along the length of the track at which the image data was captured. In this manner, a plurality of captured images produce a three-dimensional scan of the track bed in which each image of the scan has X-Y coordinates showing the contour of the track bed, and has a Z-coordinate representing the particular position of the contour along the length of rail.”

‘329 Patent col. 5:31-49. Notably, Figure 3 provides an example of the contour view of a track bed, where the “dark pixels [appearing as black lines,] represent the contour of the track bed.” ‘329 Patent col. 5:41; *see also* ‘329 Patent col. 7:51-52 (“the tie plate 14 and rail 12 are visible” in the contour image).

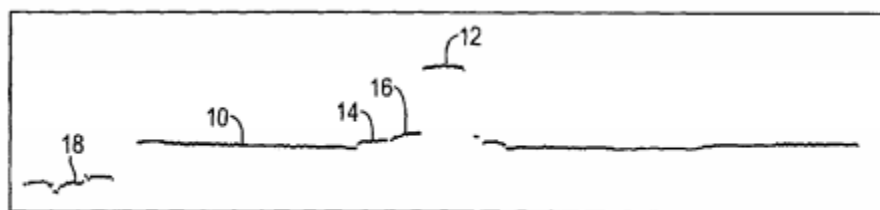
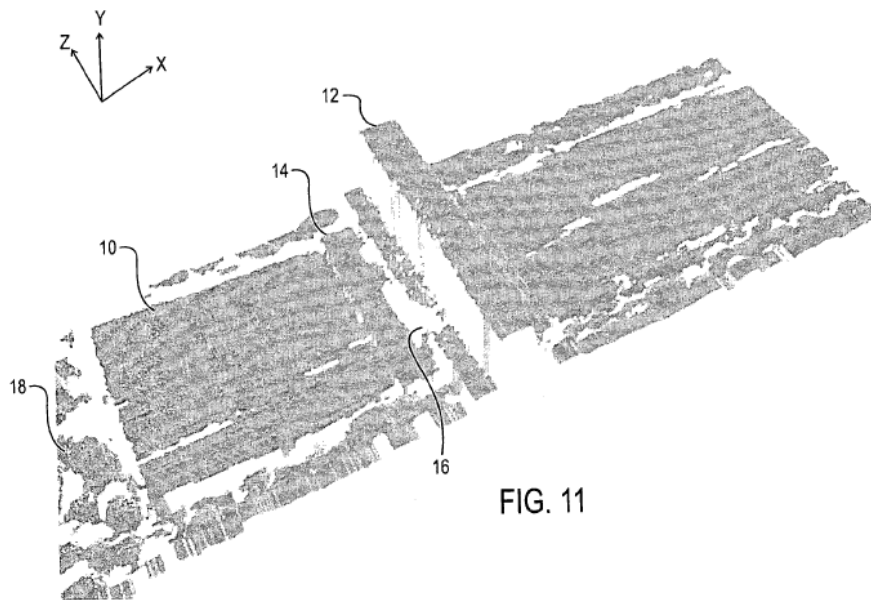


FIG. 3

329 Patent Figure 3. Figure 11 shows how “the compiled image data forms a three-dimensional representation (X, Y, and Z) of the area of the track bed,” including “[t]he orientation and

¹ At the early *Markman* Holland alleged that “[w]e look down on it” such that “there is no perspective on it,” and proceeded to demonstrate a scenario wherein the camera would be placed directly above the light source, resulting in an angle θ of zero. February Hr’g Tr. 30:9-10, 18-19. Holland then proceeded to argue that “the entire patent talks about how *efficient* it is to look at [the track bed] from this way (demonstrating), all the way around[i]t never breaks from that.” *Id.* 30:20-23 (emphasis added). The Court notes that, as a matter of simple trigonometry, a contour, such as that shown in Figure 3, cannot be produced where the angle θ between the camera and light source is zero – “perspective” is necessary to produce a “three-dimensional scan of the track bed” “[using] image processing techniques known in the art [based on an] image [that] includes [only] two pixel values.” February Hr’g Tr. 30:18; ‘329 Patent col. 5:45-46, 5:39-20. Accordingly, this is not merely a matter of “efficiency,” but is in fact an absolute mathematical necessity. *See* February Hr’g Tr. 30:21.

height[] of the tie plate 14.”² ‘329 Patent col. 7:44-46, 7:50-51.



‘329 Patent Figure 11.

III. CLAIM CONSTRUCTION

A. Applicable Law

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). In claim construction, courts examine the patent’s intrinsic evidence to define the patented invention’s scope. *See id.*; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). This intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed

² The height of a tie plate is sometimes referred to as the “step.” Doc. No. 78 at 3.

meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term’s context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can also aid in determining the claim’s meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term’s meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15.

“[C]laims ‘must be read in view of the specification, of which they are a part.’” *Id.* (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); see also *Teleflex, Inc. v. Ficoso N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor’s lexicography governs. *Id.* Also, the specification may resolve ambiguous claim terms “where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone.” *Teleflex, Inc.*, 299 F.3d at 1325. But, “[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples

appearing in the specification will not generally be read into the claims.” *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) (“As in the case of the specification, a patent applicant may define a term in prosecuting a patent.”).

Although extrinsic evidence can be useful, it is “less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert’s conclusory, unsupported assertions as to a term’s definition is entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is “less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.*

The patents-in-suit also contain means-plus-function limitations that require construction. Where a claim limitation is expressed in means-plus-function language and does not recite definite structure in support of its function, the limitation is subject to 35 U.S.C. § 112 ¶ 6. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). In relevant part, 35 U.S.C. § 112 ¶ 6) “mandates that such a claim limitation ‘be construed to cover the

corresponding structure . . . described in the specification and equivalents thereof.” *Id.* (quoting 35 U.S.C. § 112 ¶ 6). Accordingly, when faced with means-plus-function limitations, courts “must turn to the written description of the patent to find the structure that corresponds to the means recited in the [limitations].” *Id.*

Construing a means-plus-function limitation involves multiple inquiries. “The first step in construing [a means-plus-function] limitation is a determination of the function of the means-plus-function limitation.” *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). Once a court has determined the limitation’s function, “[t]he next step is to determine the corresponding structure described in the specification and equivalents thereof.” *Id.* A “structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Braun*, 124 F.3d at 1424.

B. Limitations With An “Algorithm Comprising The Steps Of” Are Not Means-Plus-Function Elements Governed by 35 U.S.C. § 112 ¶ 6

As a preliminary matter, Holland alleges Claim 16 invokes 35 U.S.C. § 112 ¶ 6 because “[t]he plain meaning of the term ‘algorithm’ is a ‘step-by step process.’” Doc. No. 78 at 6. However, Holland provides no citation for this proposition, and admits “that Claim 16 does not recite the typical ‘means for’ language.” *Id.* Georgetown counters that because Claim 16 does not use “means,” there is a rebuttable presumption that § 112 ¶ 6 does not apply.” Doc. No. 80 at 5; *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004). Specifically, Georgetown argues that “Holland [has] fail[ed] to present any evidence to overcome the presumption that 112 ¶ 6 does not apply and, therefore, the presumption prevails.” Doc. No. 80 at 5 (citing *Apex, Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1371-72 (Fed. Cir. 2003)). Georgetown is correct: nowhere in its Combined Motion for Early *Markman* Claim

Construction and Summary Judgment of Non-Infringement does Holland address any “presumption.” *See* Doc. No. 78 at 1-16.

In its Reply, Holland for the first time alleges that “[if] a claim term does not recite sufficiently definite structure, or the claim term recites function without reciting sufficient structure for performing the function, the claim term is a means-plus-function element regardless of whether it uses the ‘means-for’ signal.” *See* Doc. No. 83 at 2 (citing *Personal Audio, LLC v. Apple, Inc.*, No. 9:09-cv-111, 2011 U.S. Dist. LEXIS 157778, at *61-62 (E.D. Tex., Jan. 30, 2011)). However, nowhere does Holland aver that such an allegation is sufficient to overcome the rebuttable presumption, and instead merely implies that the presumption is rebutted because “a generic processor cannot provide the required structure to sustain the presumption against applying a means-plus-function analysis.” Doc. No. 83 at 3. Moreover, “Holland [never] support[s] this proposition with any authority[, and i]n fact, applicable authority demonstrates that the converse is true” because immediately before reciting steps (a) - (e), Claim 16 specifies an “algorithm comprising the steps of,” not “an algorithm for.” Doc. No. 105 at 4 (citing *Masco Corp. v. U.S.*, 303 F.3d 1316, 1327 (Fed. Cir. 2002) (“Neither of these claims employs the ‘step for’ language that signals the drafter’s intent to invoke § 112, paragraph 6; rather, the claims employ the term ‘steps of.’ Thus, there is no presumption that these limitations are in step-plus-function format.”)).

In its Reply for the March *Markman*, Georgetown rebuts Holland’s reliance on *Personal Audio* arguing that “*Personal Audio* demonstrates that asserted [C]laim 16 recites sufficient structure for 112 ¶ 6 to not apply” because “general-purpose computer becomes a special purpose computer, and therefor recites sufficient structure, when ‘programmed to perform particular functions pursuant to instructions from the program software.’” Doc. No. 105 at 3, 4

(citing *Personal Audio*, 2011 U.S. Dist. LEXIS 157778, at *70); see *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999) (“In a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm.”); see also *U.S. Ethernet Innovations, LLC v. Ricoh Americas Corp.*, No. 6:12-cv-235, Doc. No. 283 at 12 (E.D. Tex. Aug. 20, 2013) (This Court has previously found “that [a] comparator [] is a corresponding structure for [a] ‘comparing function.’”). As Holland admits, “[C]laim 16 has not merely recited a general purpose computer, instead it has recited sufficient structure that a [person having ordinary skill in the art (“PHOSITA”)] would understand a special purpose computer has been claimed because the claim [itself] sets forth the algorithm under which the processor is ‘programmed to perform particular functions pursuant to instructions from program software.’” Doc. No. 105 at 4 (citing *WMS Gaming Inc.*, 184 F.3d 1348); see Doc. No. 101 at 3 (Holland admitting that “[t]he algorithms, of course, are merely step-by-step processes undertaken by software operating within the processor.”). Accordingly, Holland has failed to rebut the presumption that § 112 ¶ 6 does not apply to a claim term which recites “algorithm comprising the steps of” instead of “means for,” particularly in this instance where the rule of *WMS Gaming* clearly indicates that steps (a) - (e) of the algorithm provided within Claim 16 itself provide sufficient structure with respect to “at least one processor.” ‘329 Patent col. 11:52, 11:60-12:2; see *Lighting World, Inc.*, 382 F.3d 1358; *WMS Gaming Inc.*, 184 F.3d 1349.

C. Claim Constructions

“**analyzing a frame**” (‘329 Patent col. 11:60) (February and March *Markmans*)

In Claim 16, this term appears within the context of algorithm step (a): “***analyzing a frame*** of the plurality of images, the frame comprising a region of interest.” ‘329 Patent col. 11:60-61 (emphasis added). For this term, Georgetown proposes: “[p]lain and ordinary meaning or in the alternative, examining or evaluating.” Doc. No. 80 at 10. Holland argues this term is subject to 35 U.S.C. § 112, ¶ 6, and proposes “average or summing X-Y coordinate pixel data within a contour (i.e., vertical) image.” Doc. No. 78 at 6-7; Doc. No. 101 at 9.

In view of the Court’s finding with respect to means-plus-function elements, this term is not subject to 35 U.S.C. § 112, ¶ 6. *See* Doc. No. 78 at 6 (the extent of Holland’s argument that “analyzing a frame” term is specifically subject to 35 U.S.C. § 112, ¶ 6 is that “the step[] of ‘analyzing a frame’ [has] no linking structure or steps for the ‘algorithm’ described in the ‘329 [P]atent”). Additionally, Holland’s argument, made expressly for the first time at the March *Markman*, that “the ‘analyzing’ function be carried out by software” is inapposite with the position Holland took at the February *Markman*, when Holland argued a “manner of ‘analyzing’ the image [] is disclosed in the ‘329 Patent.” Doc. No. 101 at 10 (“Holland contends that this term is indefinite for lacking corresponding structure under 35 U.S.C. § 112, ¶ 6” because “[t]he specification requires that the ‘analyzing’ function be carried out by software.”); Doc. No. 78 at 8; *see also* February Hr’g Tr. 6:24-25 (Holland acknowledged that in the specification “[t]hey actually go through and they talk about tie, crossties, and how crossties are analyzed.”).

At the March *Markman*, Holland also argued that “[i]f 35 U.S.C. § 112, ¶ 6 does not apply, then . . . Holland’s proposed construction clarifies the scope of the ambiguous term and is supported by the specification.” Doc. No. 101 at 10. With respect to its proposed construction

specifically, Holland argues that “‘analyzing’ has no ordinary meaning . . . because there are an infinite number of ways a ‘frame of a plurality of images’ can be ‘analyzed,’ ‘examined’ or ‘evaluated.’” Doc. No. 78 at 7. Holland contends that the only “manner of ‘analyzing’ the image [that] is disclosed in the ‘329 Patent” is at “[c]ol. 8, lines 17-24 of the ‘329 patent,” which described “averaging or summing the value of pixels in the region of interest R.” Doc. No. 78 at 8; ‘329 Patent col. 8:19-20. However, Holland omits that the reference to “averaging or summing” in the specification is prefaced with “for example,” indicating that this is not the only method by which computer analysis might be performed. ‘329 Patent col. 8:19.

Georgetown replies first by clarifying that “a frame” “does not require construction to a PHOSITA” because a PHOSITA would understand that “[a] frame of ‘a plurality of images’ is a single one of the continuously captured images.” Doc. No. 105 at 7. Georgetown then addresses the heart of the disputed term, “analyzing,” arguing that “‘analyzing’ is a common English word that does not require anything beyond ordinary meaning.” *Id.* Specifically, Georgetown argues that Holland’s construction is inappropriate because Holland’s “construction requires importing limitations for the specification into [C]laim 16[, because, at the very least C]laim 16 doesn’t even mention pixels.” February Hr’g Tr. 16:18-20.

Holland’s self-contradictory position seeks to import an isolated “example” from the specification. ‘329 Patent col. 8:19. Moreover, Holland has failed to explain why a PHOSITA would not understand “analyzing” in view of the explanation provided within the specification.³ See ‘329 Patent col 7:55-10:22 (detailing numerous ways of “analyzing”). Accordingly, the Court gives “analyzing a frame” its plain and ordinary meaning.

³ It is also notable that the specification refers to “software programs for storing and analyzing the various data obtained with the disclosed inspection system” and provides six examples of “suitable” software, further reinforcing that “analyzing” is well understood by a PHOSITA. ‘329 Patent col. 5:6-10.

“region of interest” (‘329 Patent col. 11:61) (February and March *Markmans*)

In Claim 16, this term appears within the context of algorithm step (a): “analyzing a frame of the plurality of images, the frame comprising a ***region of interest***.” ‘329 Patent col. 11:60-61 (emphasis added). For this term, Georgetown proposes: “[p]lain and ordinary meaning or in the alternative, a space or area of interest.” Doc. No. 80 at 11. Holland proposes “a predefined area within the contour (i.e., vertical) image that is located below the top of the rail and above a crosstie.” Doc. No. 78 at 9; Doc. No. 101 at 11. The parties’ disagreement primarily concerns whether a PHOSITA would understand the plain and ordinary meaning of “region of interest.”

Holland’s argument focuses intensely on “region of interest” as it relates to a tie plate, while discounting the possibility that a “region of interest” could, under different circumstances, relate to any other structure, such as “sections of rail.” ‘329 Patent Figure 6A (indicating “region of interest” “R” corresponding to “Gap Sizes Between Sections of Rail”); *id.* col. 8:16 (providing that “region of interest” in the figures is indicated by “R”); *see* Doc. No. 78 (Holland arguing “Georgetown’s proposed construction is broader than Holland’s in that Georgetown asserts that the ‘region of interest’ as it relates to Claim 16 of the ‘329 [P]atent is any region of interest referenced in the patent-in-suit”). Georgetown implicitly agrees with Holland’s characterization, explaining that “the specification makes clear that a region of interest is the area or space in an image that is relevant to the particular analysis being performed,” such that the “region of interest” could be any region corresponding to where an analysis is being performed. Doc. No. 80 at 11.

“Region of interest” appears 14 times in the specification, and it appears in relation to a variety of structures including rails, cross ties, ballast, raised spikes, and tie plates. ‘329 Patent

col. 8:65, 9:36, 10:2-3, 10:9-10, 10:17. Moreover, the term, “region of interest” appears to be exactly the type of widely used term that would be understood by a PHOSITA. Specifically, the ‘329 Patent refers to “Region of Interest (ROI) tools” that are “known in the art of analyzing image data from the cameras,” indicating “region of interest” is a term which would be known to a PHOSITA familiar with such tools. ‘329 Patent col. 5:12-13. Accordingly, the Court gives “region of interest” its plain and ordinary meaning.

“determining” (‘329 Patent col. 11:62) (February *Markman*)

The parties have presented three instances of “determining” for construction. As a preliminary matter, it is noteworthy that the construction for this singular instance of “determining” applies only to Claim 16 algorithm step (b): “determining whether the region of interest contains a tie plate.” ‘329 Patent col. 11:62-63. Specifically, it is clear from the briefing for the February *Markman* that the only instance of “determining” at issue in February was that which is recited at col. 11:62, as evidenced by the fact that Holland’s briefing opens by reciting the specific language which surrounds “determining” at col. 11:62. *See* Doc. No. 78 at 11 (“The step of determining whether the region of interest contains a tie plate”); ‘329 Patent col. 11:62-63 (“determining whether the region of interest contains a tie plate”). Additionally, Georgetown’s Response is narrowly limited to the single instance of “determining” addressed in Holland’s briefing. *See* Doc. No. 80 at 12-13. Moreover, the Joint Claim Construction Chart (Doc. No. 92-1) submitted by the parties for the February *Markman* only addressed “determining” within the context of “determining whether the region of interest contains tie plate,” and implicitly declines to address “determining” within any other context, as evidenced by the empty cells corresponding to “determining” as used in steps (c) and (e) of the Claim 16 algorithm. Doc. No.

92-1 at 5 (Holland and Georgetown both only provide a proposed construction for “determining” corresponding to “determining” as recited in step (b) of the Claim 16 algorithm at col. 11:62.).

For this term, Georgetown proposes: “[p]lain and ordinary meaning or in the alternative, to conclude, establish, or ascertain.” Doc. No. 80 at 12; Doc. No. 96 at 8. Holland argues this term is subject to 35 U.S.C. § 112, ¶6, and proposes: “comparing the average or sum of the X-Y coordinate pixel data within the region of interest to a value derived from averaging or summing X-Y coordinate pixel data within the region of interest when a tie plate is not present.” Doc. No. 78 at 6, 11; Doc. No. 101 at 12.

In view of the Court’s finding with respect to means-plus-function elements, this term is not subject to 35 U.S.C. § 112, ¶ 6. *See* Doc. No. 78 at 6 (the extent of Holland’s argument that “determining” term is specifically subject to 35 U.S.C. § 112, ¶ 6 is that “the step[] of [] ‘determining’ [has] no linking structure or steps for the ‘algorithm’ described in the ‘329 [P]atent.”). Moreover, Holland’s argument at the March *Markman*, that “determining” is indefinite “because there is no corresponding structure as required by § 112, ¶ 6,” because “[t]o perform such function, a general purpose computer would need to be adapted to contain an algorithm specific and to be capable of determining (1) a region of interests and (2) a tie plate” ignores the fact that the very “determining” step that is recited in the expressly claimed algorithm which gives “at least one processor” sufficient structure in accord with *WMS Gaming*, as discussed above. Doc. No. 101 at 13; *see WMS Gaming Inc.*, 184 F.3d at 1349 (Where a “disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm.”).

At the March *Markman*, Holland also argued that its proposed construction was necessary because it “is the only method of ‘determining’ that is envisioned and disclosed in the ‘329 patent.” Doc. No. 101 at 13; *see* Doc. No. 78 at 11 (citing ‘329 Patent col. 8:13-24 as where the patent “describes [] how to determine whether the region of interest contains an object, such as a cross tie.”) Georgetown addressed this argument at the February *Markman*, accusing Holland of “once again improperly import[ing] limitations from a specific embodiment into the claim language.” Doc. No. 80 at 12-13.

Here, Holland seeks to import implicit limitations associated with the single occurrence of a word which appears a total of seven times throughout the specification.⁴ *See* ‘329 Patent col. 2:21, 2:30, 8:13, 8:61, 9:10, 9:35, 10:17. Moreover, Holland has failed to explain why a PHOSITA would not understand “determining” in view of the explanation provided throughout the specification. *See* Doc. No. 80 at 13 (Georgetown arguing “a PHOSITA would understand the examples discussed in the ‘329 Patent specification are but some, exemplary, was of performing the claimed algorithm steps”). Accordingly, the Court gives “determining” its plain and ordinary meaning.

“determining” (‘329 Patent col. 11:64) (March *Markman*)

In Claim 16, this term appears within the context of algorithm step (c): “if a tie plate is present, **determining** a crosstie contour and tie plate contour.” ‘329 Patent col. 11:64-65 (emphasis added). Holland provides no proposed construction for this specific instance of “determining” in its Response. Doc. No. 101 at 13-16 (Holland has demarcated step (c) of the Claim 16 algorithm “phrase no. 9,” and indicates that “crosstie contour” and “tie plate contour”

⁴ Notably, Holland also expressly disclaims the relevance of tie plates to the language it draws upon for its proposed construction, further undermining the relevance of its proposed construction. *See* Doc. No. 78 at 11 (“The step of determining whether the region of interest contains a tie plate is not specifically described in the ‘329 [P]atent. However, . . . how to determine whether the region of interest contain an object, such as a crosstie [is].”)

are both at issue in “phrase no. 9,” but nowhere in its Response does it indicate “determining” is at issue in “phrase no. 9,” nor does Holland provide a proposed construction for “determining” in “phrase no. 9” anywhere in its Response).⁵ Accordingly, in the absence of any proposed construction provided by Holland itself, the Court finds there is no genuine dispute as to the meaning of this term and therefore declines to consider the meaning of “determining” as it appears in the ‘329 Patent at step (c) of the algorithm recited in Claim 16.⁶ ‘329 Patent col. 11:64,

“**crosstie contour**” (‘329 Patent col. 11:64) (March *Markman*)

In Claim 16, this term appears within the context of algorithm step (c): “if a tie plate is present, determining a **crosstie contour** and tie plate contour.” ‘329 Patent col. 11:64-65 (emphasis added). For this term, Georgetown proposes: “[plain and ordinary meaning] or in the alternative, an outline, an edge, or a line that represents the profile of the crosstie.” Doc. No. 96 at 13. Holland proposes: “a partial filtered contour image derived from the crosstie region of interest and consisting only of dark pixel values.” Doc. No. 10 at 14. The parties’ disagreement concerns the meaning of “contour.” See Doc. No. 96 at 13 (Georgetown points out that “there is not dispute over the term “crosstie”); Doc. No. 101 at 13-15 (the entirety of Holland’s Response focuses on “contour”).

⁵ Georgetown’s Claim Construction Brief for the March *Markman* included a Claim Chart (Doc. No. 96-6), identical to the “P.R. 4-3 Joint Claim Construction Chart for the ‘329 Patent” (Doc. No. 79-1) provided with the Joint Prehearing Statement, which provides a proposed construction of “determine” allegedly attributable to Holland. A similar, but not identical, version of this chart was provided by the parties along with printed copies of the March *Markman* briefing. The chart submitted with the March *Markman* briefing material is labeled “P.R. 4-3 Joint Claim Construction Chart for the ‘329 Patent,” suggesting that Holland’s dispute with respect to “determining” at col. 11:64 in in step (c) of the Claim 16 algorithm was dropped before Holland filed its Responsive brief.

⁶ Notably, Georgetown’s “Preliminary Claim Construction Chart” (Doc. No. 96-6), provided with its Claim Construction Brief for the March *Markman*, proposes “[plain and ordinary meaning] or in the alternative, to conclude, establish or ascertain,” as it does for all instances of “determining.” All argument with respect to “determining” in Georgetown’s Mach *Markman* briefing refers to the “early *Markman* briefing, see, Dkt. 80, p. 12-13,” where only “determining” at col. 11:62 with respect to step (a) of the Claim 16 algorithm was at issue. Doc. No. 96 at 17; see also *id.* at 8 (“Georgetown respectfully submits that ‘determining’ should be construed the same here as it argued in the early *Markman* briefing.”)

Georgetown argues that “‘contour’ is consistently used in the specification” and that “the patentee never disclaimed any portion of the term contour.” Doc. No. 96 at 13-14. Holland responds by relying heavily on the description provided at col. 3:43-47 and Figure 3. Doc. No. 101.⁷ Holland also relies on the description of the ways in which the an “image or frame showing the projected line L of the track bed” may be treated with “image processing techniques known in the art . . . where the dark pixels represent the contour of the track bed.” ‘329 Patent col. 5:35-41. Additionally, Holland argues that “crosstie contour” should be limited to “that portion of the contour image that appears within the region of interest.” Doc. No. 101 at 15 (Holland relies on its “above” proposed construction relating to “region of interest,” which the Court has declined to adopt.).

However, Holland’s proposed construction is inconsistent with the use of “contour” throughout the specification at least because Holland refers to “dark pixel values,”⁸ that are the result of “filtering and image processing techniques.” ‘329 Patent col. 5:39-40; *see* Doc. No. 101 at 14 (Holland explaining that “[t]he dark pixel values are show in the vertical *contour image*, FIG. 3,” an “*image*” which Holland admits is the product of “filtering and other image processing techniques known in the art”(emphasis added) (citing ‘329 Patent col. 5:39-40)). In fact, the specification goes to great lengths to explicitly explain what the “contour” is and how it is captured. ‘329 Patent col. 3:45-47 (“beam 42 produces a projected line L, shown in FIG. 2, on the track bed that follows the *contours of the surfaces and components* of the track bed” (emphasis added)); *id.* col. 5:33-35 (“the projected line L shown in FIG. 2 follows the *contours*

⁷ Georgetown notes in its Reply that “Holland, for the first time, also argues that these terms are indefinite.” Doc. NO. 105 at 8. Holland does not explain why it has re-raised the issue of “determining” with respect to “contour,” though it seems Holland is attempting to argue that “crosstie contour” is indefinite by re-arguing “determining.” Since “determining” is not at issue with respect to this term, Holland’s argument that this term is indefinite because “there is no guidance for ‘determining a crosstie contour’ as opposed to overall contour image, as shown for example in FIG. 3 above,” will not be considered. Doc. No. 101 at 15.

⁸ Notably, the exact term “dark pixel values” does not appear in the ‘329 Patent, though “dark pixels” are referenced three times. *See* ‘329 Patent col 5:41, 8:21, 9:2.

of the surface and components of the track bed” (emphasis added)); *id.* col 4:43-35 (“[e]ach still image or frame captured by the cameras 50 is filtered and processed to isolate the contoured laser line L projected on the track bed.”); *see also* Doc. No. 96 at 13-14.

Given the extensive use of “contour” throughout the specification, including the various types of “contours” expressly contemplated, the meaning of “contour” would be apparent to one of ordinary skill in the art at the time of the invention in the context of the entire patent. *See* Doc. No. 105 at 9 (citing the ‘329 Patent FIGS 4A-4C (labeled “Spacing Between Crossties”), col. 7:56-59 (“[r]efering to FIGS 4A-4C, example frames of the track bed obtained with the disclosed inspection system 30 are illustrated that can be used to determine the spacing between the crossties 10.”); FIG. 5 (labeled “Angle Of Crosstie With Respect To Rail”), FIGS. 6A-6C (labeled “Gap Size Between Sections Of Rail”), FIGS. 7A-7B (labeled “Rail Wear”), FIG. 8 (labeled “Defects In Rail/Spacing Of Rail/Size Of Crossties/Ballast Height Relative To Crossties”), FIG. 9 (labeled “Raised Spike”), FIG. 10 (labeled “Missing Tie Plates”)). Accordingly, the Court gives “crosstie contour” its plain and ordinary meaning.

“tie plate contour” (‘329 Patent col. 11:65) (March *Markman*)

In Claim 16, this term appears within the context of algorithm step (c): “if a tie plate is present, determining a crosstie contour and *tie plate contour*.” ‘329 Patent col. 11:64-65 (emphasis added). For this term, Georgetown proposes: “[plain and ordinary meaning] or in the alternative, an outline, an edge, or a line that represents the profile of the tie plate.” Doc. No. 96 at 14. Holland proposes: “a partial filtered contour image derived from the tie plate region of interest and consisting only of dark pixels.” Doc. No. 101 at 15.

The parties’ disagreement is essentially the same as with “crosstie contour.” Doc. No. 96 at 14 (Georgetown merely reiterates that it believes a PHOSITA would understand this term

without additional construction); Doc. No. 101 at 15-16 (Holland provides one sentence describing the arguments as “similar” to those presented with respect to “crosstie contour”); Doc. No. 105 (Georgetown addresses “crosstie contour” and “tie plate contour” in a single combined argument). Accordingly, in view of the Court’s construction with respect to “crosstie contour, the Court gives “tie plate contour” its plain and ordinary meaning.

“comparing” (‘329 Patent col. 11:66) (March *Markman*)

In Claim 16, this term appears within the context of algorithm step (d): “**comparing** an orientation of the crosstie contour and an orientation of the tie plate contour.” ‘329 Patent col. 11:66-67 (emphasis added). For this term, Georgetown proposes: “[plain and ordinary meaning] or in the alternative, noting or examining the similarities and differences of.” Doc. No. 96 at 15. Holland argues this term is “[s]ubject to 35 U.S.C. § 112, para. 6” and also alleges that “any construction of this term leads to ‘insoluble ambiguity.’” Doc. No. 101 at 16-17 (Holland merely alleges that it “*believes* that any construction of this term leads to ‘insoluble ambiguity’ and it is therefore indefinite under § 112,” and that it “is accordingly indefinite because there is no disclosed structure tied to ‘comparing.’”) (emphasis added).

The parties’ disagreement concerns whether “a missing or sunken tie plate has [any] contour.” Doc. No. 101 at 16 (Holland alleges that a misalignment of a tie plate cannot be detected if the tie plate is missing because it has no contour); *see* Doc. No. 105 at 9-10 (Georgetown explains that “Holland improperly points to FIG. 10, which is clearly labeled as showing a “Missing Tie Plate,” and, after setting up this straw man, concludes that ‘a missing or sunken tie plate has no contour.’”).

The ‘329 Patent refers to “missing tie plates” in contrast to “misaligned tie plates” and “sunken tie plates” numerous times. *See* ‘329 Patent col. 2:22-26 (“The measurable aspects that

can be determined by the disclosed system include but are not limited to: . . . missing tie plates, misaligned tie plates, sunken tie plates”); *id.* col. 3:5-6 (“FIG 10 illustrates an example frame of railroad track obtained with the disclosed inspection system for determining a missing tie plate.”); *id.* col. 10:12-13 (“In other examples, missing tie plates, misaligned tie plates, or sunken tie plates can be detected from the image data”). In fact, the ‘329 Patent expressly provides that “[r]eferring to FIG. 10, an example frame of railroad track obtained with the disclosed inspection system is illustrated, [demonstrating how a] missing or sunken tie plate can be detected, for example by analyzing the region of interest R and determining whether a portion of the contour representing tie plate occurs or does not occur within the region R.” ‘329 Patent col. 10:14-19. Accordingly, the ‘329 Patent discloses detection of a missing tie plate wherein a missing tie plate may be indicated by a contour representing a tie plate not occurring.

Thus, it is self-apparent that the “comparing” which Holland argues is demonstrated by FIG. 10 includes the possibility of a “comparing” in which the “contour” representing a tie plate [] does not occur,” such as could be the case when detecting a missing tie plate. *See* Doc. No. 101 at 16-17 (Holland argues that “as illustrated in FIG. 10 of the ‘329 [P]atent, reproduced below, a missing or sunken tie plate has no contour.”) (emphasis omitted). Additionally, Holland fails to explain “why a PHOSITA would not be able to compare a ‘missing’ contour . . . to a cross tie contour and conclude that the tie plate was missing or sunken.” Doc. No. 105 at 10. Accordingly, the Court gives “comparing” its plain and ordinary meaning.

“orientation” (‘329 Patent col. 11:66-67) (March *Markman*)

In Claim 16, this term appears within the context of algorithm step (d): “comparing an *orientation* of the crosstie contour and an *orientation* of the tie plate contour.” ‘329 Patent col. 11:66-67 (emphasis added). For this term, Georgetown proposes: “[plain and ordinary meaning]

or in the alternative, the position or location of.” Doc. No. 96 at 16. Holland argues that this term is indefinite because, as it alleged with respect to “comparing,” “the missing or sunken tie plate has no contour; thus, it cannot be analyzed, determined, or compared.” Doc. No. 101 at 18.

In view of the Court’s finding that a PHOSITA would be able to compare a contour missing a tie plate to a cross tie contour and conclude that the tie plate was missing, Holland’s argument that the term “orientation” is insolubly ambiguous is inapplicable. Holland appears to have proposed an alternative construction within its briefing, proposing that “the ‘orientation’ of the tie plate contour is a projected linear approximation (*i.e.*, a first degree polynomial ‘best fit’ line) of the tie plate contour through line fitting the individual data points that constitute the tie plate contour.” Doc. No. 101 at 18-19.⁹ However, no reference to a “projected linear approximation” or “first degree polynomial ‘best fit’ line” appears in the ‘329 Patent, and Holland provides no explanation for why such limitations are necessarily applicable.

Georgetown replies that, as with “comparing,” “Holland’s proposed ‘insoluble ambiguity’ is illusory [because] Holland ignores the understanding of a PHOSITA and creates an artificial ambiguity out of a ‘missing’ contour.” Doc. No. 105 at 10. In view of the Court’s construction with respect to “comparing” the Court gives “orientation” its plain and ordinary meaning.

“crosstie contour” (‘329 Patent col. 11:66) (March *Markman*)

In view of the Court’s finding with respect to “crosstie contour” in the ‘329 Patent at col. 11:64, above, the Court finds that the construction for “crosstie contour” in the ‘329 Patent at col. 11:66 is the same as for “crosstie contour” in the ‘329 Patent at col. 11:64.

⁹ Holland’s briefing filed for the March *Markman* indicates only that it alleges that “[t]his term is indefinite” in the box corresponding to “Holland’s Proposed Claim Construction,” and 4-5(d) chart submitted by the parties in advance of the March *Markman* indicated only that “Holland’s Proposed Construction” was that “[t]his term is indefinite.” Doc. No. 101 at 18.

“tie plate contour” (‘329 Patent col. 11:67) (March *Markman*)

In view of the Court’s finding with respect to “tie plate contour” in the ‘329 Patent at col. 11:65, above, the Court finds that the construction for “tie plate contour” in the ‘329 Patent at col. 11:67 is the same as for “tie plate contour” in the ‘329 Patent at col. 11:65.

“determining” (‘329 Patent col. 12:1) (March *Markman*)

In Claim 16, this term appears within the context of algorithm step (e): **“determining** whether the tie plate is misaligned or sunken based upon the comparison.” ‘329 Patent col. 12:1-2 (emphasis added). As with all instances of “determining” in dispute, Georgetown proposes: “[plain and ordinary meaning] or in the alternative, to conclude, establish or ascertain.” Doc. No. 96 at 17; Doc. No. 105 at 7-8.¹⁰ Holland does not propose any actual construction as it did with respect to the use of “determining” in step (b) of the Claim 16 algorithm, instead arguing only this singular instance of “determining” in step (e) of the Claim 16 algorithm is indefinite and “[s]ubject to 35 U.S.C. § 112, para. 6.” Doc. No. 101 at 19 (Holland reiterates its indefiniteness argument based on the view that a missing tie plate “cannot be analyzed, determined, or compared [because] it has no orientation, no position and no location.” Moreover, Holland fails to provide any argument relating to structures or functions in support of its bare allegation that this term is subject to 35 U.S.C. § 112, ¶ 6.). As a last ditch effort, in the final sentence of its Response addressing this term, Holland appears to propose that this instance of “determining” should be construed as “identifying the tie plate as misaligned or sunken if the

¹⁰ Georgetown correctly notes that “[t]his term appears [only twice in Holland’s briefing, once] in Holland’s ‘Phrase No. 8’ [which corresponds to step (b) of the Claim 16 algorithm,] and [a second time in] ‘Phrase No. 11’” which corresponds to step (e) of the Claim 16 algorithm. Doc. No. 105 at n.4. Georgetown also argues “the term should be construed the same for both phrases[, because] the same reasoning applies to both phrases.” *Id.*

crosstie contour and the tie plate contour are not parallel,” but provides no argument or reasoning.¹¹ Doc. No. 101 at 20.

Holland’s argument that this singular instance of “determining” is indefinite echoes its arguments with respect to “comparing” and “orientation,” as resolved above. As with its earlier arguments, Holland fails to address the understanding of a PHOSITA. Additionally, Holland’s argument overlooks the fact that “the ‘329 Patent discloses, at least one way of ‘determining’ by averaging or summing pixel values.” Doc. No. 105 at 8; ‘329 Patent col. 8:18-20; *id.* col. 8:66-9:1. In view of the Court’s above finding that a PHOSITA would be able to compare a contour missing a tie plate to a cross tie contour and conclude that the tie plate was missing, and in view of the Court’s above finding with respect to means-plus-function elements, this term is not subject to 35 U.S.C. § 112, ¶ 6 and the Court according gives this instance of “determining” its plain and ordinary meaning.

“**misaligned**” (‘329 Patent col. 12:1) (March *Markman*)

In Claim 16, this term appears within the context of algorithm step (e): “determining whether the tie plate is ***misaligned*** or sunken based upon the comparison.” ‘329 Patent col. 12:1-2 (emphasis added). As agreed in the briefing, the Court construes “misaligned” to mean “not being aligned with another structure.” Doc. No. 96 at 7-8 (“Georgetown does not object if the Court agrees to adopt Holland’s proposed construction for misaligned.”); Doc. No. 101 at 20-21 (Holland represents that “Georgetown has agreed to adopt Holland’s proposed claim construction as to the term ‘misaligned.’”).

¹¹ Holland’s briefing filed for the March *Markman* indicates only that it alleges that “[t]his term is indefinite” in the box corresponding to “Holland’s Proposed Claim Construction,” and 4-5(d) chart submitted by the parties in advance of the March *Markman* indicated only that “Holland’s Proposed Construction” was that “[t]his term is indefinite.” Doc. No. 101 at 19.

IV. CONCLUSION

For the foregoing reasons, the Court interprets the claim language in this case in the manner set forth above.

So ORDERED and SIGNED this 7th day of August, 2014.



JOHN D. LOVE
UNITED STATES MAGISTRATE JUDGE